Natural Resources

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Overview

The Delta is a unique geographic area in the State of California, a low-lying region of rich mineral and peat soils, composed of islands created largely by humans as they diked and drained the prehistoric marshes of the region. The geology of the region created this unique "Delta". Sediments trapped inland of the rocky neck of the Carquinez Straits resulted in the creation of this 1,100 square-mile area. Based on the geological characteristics of the Delta, there is potential for seismic activity in the region.

The peat soils of the central and western Delta have oxidized, resulting in subsidence of land surfaces of up to 20 feet. Original peat soil depths varied substantially from area to area and even within a given island. Subsidence has slowed to about one-third of an inch a year in many areas.

Flood threats are compounded by the low elevations of the Delta and by subsidence. Twice in each approximately 25-hour period the elevation of the Sacramento River rises and falls about three feet due to the tidal cycle. The threat of flooding is generally associated with periods of high winter rainfall and periods of rapid spring snow melt in the watersheds draining into the Delta. The most critical conditions occur when upstream dams are full and the resulting high rates of river flow combine with high tides and strong winds.

The lush wetland habitats surrounded by riparian woodlands have been replaced by agricultural lands including cultivated and irrigated croplands as well as irrigated and non-irrigated pasture lands. Remnants of natural habitat are located largely along some sloughs and rivers and on small channel islands. Pockets of wooded or wetland habitat exist on some islands.

The aquatic habitats historically ranged from fresh to brackish and were home to both resident and migratory fish. Modern aquatic habitats are affected by flows released from upstream dams, seasonal drainage from agricultural lands, and year-round drainage from sources outside the Primary Zone. Several large, freshwater lakes are located on the eastern edge of the Delta, providing year-round wetland habitat.

Species native to the Delta evolved within an ecosystem that was much different than today. Many of the indigenous species have declined because of ecosystem changes over the past 150 years including:

- Loss of habitat.
- Loss of access to upstream habitat for anadromous fish from construction of dams.
- Diking and draining of Delta lands to convert marshes to farms.
- Urbanization.
- Changes in river flows.

- Construction of levees that separate rivers from their floodplains thereby eliminating channel meander and riparian habitat.
- Invasion by non-native species.
- Alterations in hydrology, particularly the elimination of variability in seasonal flow patterns.
- Reduction in seasonal and annual variability in salinity.
- Introduction of numerous toxic substances.
- Export pumping in the South Delta.

Flow patterns in the Delta are governed by inflows, large water diversions, and tidal flows. The relative importance of these flows varies with season and location. Net—tidally averaged—flows depend on inflows from the rivers and export pumping in the southern Delta. Sometimes the combination of inflows and exports causes "reverse flow," or a situation when flow moves upstream rather than downstream. These flows can cause young fish, including eggs and larvae, to be entrained at the pumping facilities of the State Water Project and the Central Valley Project.

The Delta provides substantial habitat for resident and migratory waterfowl and shorebirds. The abundance of these birds declined precipitously in the Delta because of land reclamation, although subsequent changes in cropping patterns have allowed populations of some species to increase.

The Delta supports hundreds of fish, plants, mammals, amphibians, reptiles, and invertebrates. Many of the native species have declined in abundance and in range, leading to the listing of several species under the California and/or federal Endangered Species Acts. Early species declines were caused by loss or isolation of physical habitat when the Delta islands were drained. However, due to the information collected as a result of monitoring activities that occurred in the 1960's through the 1980's, it is clear that species declined due to a variety of causes including changing climate; effects of toxic substances; alteration of habitat; introduction of non-native species that consume, compete with, or alter the habitat of native species; water diversions/exports; and changes in hydrology.

In the past few years, the abundance of several pelagic (open water) fish species inhabiting the Delta, such as delta smelt and longfin smelt, have declined to record-low levels. The reasons for this pelagic organism decline are multiple and are the subject of intense investigation. The loss of pelagic species in the Delta seems to be a function of poor conditions for food conditions, invasive species, degraded water quality, losses to export pumping, and other potential negative influences, such as toxins. The populations of salmon that migrate through the Delta and are dependent on Delta resources have also experienced precipitous declines, which have adversely affected the fishing industry.

Long-term trends for the ecosystem depend on the severity of climate change and the future physical structure and salinity of the Delta. Large mammals, such as bear and elk, which historically lived in and around the Delta have either been eliminated or reduced to extremely low numbers. Aquatic mammals, including beaver and otter still remain. Some resident and migratory birds have adapted to the agricultural practices in the Delta, particularly the small grain fields which are flooded in fall and winter months. Migratory birds include ducks, geese, swans, cranes, and shorebirds. Hawks and eagles forage in the Delta fields. The Primary Zone, with its large open expanses of farmland, mosaic of small grain crop residues and shallow flooded fields, permit wildlife to feed and rest, thereby providing high quality wildlife habitat.

It is recognized that Habitat Conservation Plans and Natural Community Conservation Planning (HCP/NCCP) efforts within the Delta, including the CALFED Ecosystem Restoration Program Plan (ERPP) 4, must be acknowledged in the administration of the policies of the Plan as these programs include agreements and/or contracts that have long-term provisions to sustain a durable program.

Goals

Preserve and protect the natural resources of the Delta. Promote protection of remnants of riparian and aquatic habitat. Encourage compatibility between agricultural practices and wildlife habitat.

Policies

P-1.
Preserve and protect the natural resources of the Delta. Promote protection of remnants of riparian and aquatic habitat. Encourage compatibility between agricultural practices, recreational uses and wildlife habitat.

P-2.
Encourage farmers to implement management practices to maximize habitat values for migratory birds and other wildlife. Appropriate incentives, such as: purchase of conservation easements from willing sellers or other actions, should be encouraged.

P-3.
Lands managed primarily for wildlife habitat should be managed to maximize ecological values. Appropriate programs, such as "Coordinated Resource Management and Planning" (Public Resources Code Section 9408(c)) should ensure full participation by local government and property owner representatives.

P-4.
Support the non-native invasive species control measures being implemented by the California Department of Fish and Game, the California Department of Boating and Waterways, the California Emergency Management Agency, the California Department of Food and Agriculture, the State Water Resources Control Board, the Central Valley and San Francisco Bay Regional Water Quality Control Boards, and the Agricultural Commissioners for the five Delta Counties

(Yolo, Solano, Sacramento, San Joaquin, and Contra Costa), which include controlling the arrival of new species into the Delta.

P-5.
Preserve and protect the viability of agricultural areas by including an adequate financial mechanism in any planned conversion of agricultural lands to wildlife habitat for conservation purposes. The financial mechanism shall specifically offset the loss of local government and special district revenues necessary to support public services and infrastructure.

P-6.
Support the implementation of appropriate buffers, management plans and/or good neighbor policies (e.g. safe harbor agreements) that among other things, limit liability for incidental take associated with adjacent agricultural and recreational activities within lands converted to wildlife habitat to ensure the ongoing agricultural and recreational operations adjacent to the converted lands are not negatively affected.

P-7.
Incorporate, to the maximum extent feasible, suitable and appropriate wildlife protection, restoration and enhancement on publicly-owned land as part of a Delta-wide plan for habitat management.

P-8.
Promote ecological, recreational and agricultural tourism in order to preserve the cultural values and economic vitality that reflect the history, natural heritage and human resources of the Delta including the establishment of National Heritage Area designations.

P-9.
Protect and restore ecosystems and adaptively manage them to minimize impacts from climate change and other threats and support their ability to adapt in the face of stress.

P-10.
Ensure that design, construction, and management of any flooding program to provide seasonal wildlife and aquatic habitat on agricultural lands, duck club lands and additional seasonal and tidal wetlands, shall incorporate "best management practices" to minimize vectors including mosquito breeding opportunities, and shall be coordinated with the local vector control districts, (each of the four vector control districts in the Delta provides specific wetland/mosquito management criteria to landowners within their district.)